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LESSER BLACK-BACKED GULL IN CALIFORNIA, WITH NOTES ON FIELD IDENTIFICATION

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On 14 January 1978 Ronald L. Branson, Benjamin D. Parmeter, John Parmeter and I saw a British Lesser Black-backed Gull *(Larus fuscus graellsii)* on the west side of Robert's Lake, Monterey, Monterey Co., California, about 0.8 km inland from the Pacific Ocean beach. This is the westernmost record for the species in North America; the only previous western records are from Colorado, the Texas coast and the Northwest Territories (see Discussion).

The only race collected in North America is *L. f. graellsii* (American Ornithologists' Union 1957, Jehl 1958, Mumford and Rowe 1963, Woolfenden and Schreiber 1974), although the Northwest Territories bird and one observed at Newburyport, Massachusetts (Finch 1976) were thought to be nominate *fuscus*.

SIGHTING

When discovered, the Monterey bird was loafing with about 80 other gulls on a patch of bare ground near the lake edge and about 10 m from where we sat in our van. Included in the flock and thus available for direct comparison were adults of the California Gull *(L. californicus)*, Western Gull (both *L. occidentalis wymani* and *L. o. occidentalis*) and Glaucous-winged Gull *(L. glaucescens)*, as well as several American Coots *(Fulica americana)*.

We scrutinized the bird for 10 minutes (1500-1510), using binoculars and a 20x spotting scope. Although clouds obscured the sun and a slight mist was falling, the fairly bright sky, open terrain and close range afforded good lighting. Branson obtained four good Kodachrome slides with the aid of a 400 mm lens set at f5.6, 1/60 sec.; analysis of the foot colors of the various ages of California Gulls demonstrates that the color fidelity of the slides is excellent.

The Lesser Black-backed Gull spent several minutes preening but most of the time dozed with neck retracted and eyes often partially closed, apparently much at ease. Eventually the arrival of another car caused the flock to rise and scatter, only a few birds returning to the loafing area. The Lesser Black-backed flew inland, circled twice over a nearby pond and then flapped eastward alone until out of sight. When it took off, two of us (L.C.B., B.D.P.) obtained views of the wing pattern. Despite an intensive search during subsequent weeks, the bird could not be found again.

DESCRIPTION

The following description of the Monterey bird was written using only our original field notes and microscopic examination of the four photographs (Figure 1). A copy of this paper and the original photographs are on file with the California Bird Records Committee. References to the Herring Gull pertain to the North American subspecies, *L. argentatus smithsonianus*. **Age and molt:** adult in fresh basic (winter) plumage; no wear noticeable on wing or tail tips; when preening, bird twice spread left wing tip, revealing an outermost (10th) primary only about half-grown; slides indicate that the 9th primary was not fully grown, its white apical spot merging in part with that of the normally much shorter 8th; no other molt evident. **Body size:** length and bulk of body (including wings and tail) slightly larger than in California Gull, considerably smaller than in Western Gull, and hence very similar to those of small Herring Gull. **Body shape:** perhaps slightly more elongate than in California and thus about same as in Herring; head larger in proportion to body than in most individuals of larger gull species (e.g. Western Gull). **Forehead:** dove-shaped, slightly more vertical in relation to culmen than in California and very much less sloped than in Western. **Bill size and shape:** like that of small Herring or perhaps slightly finer throughout; field observations, supported by micrometer measurements of slide images, show bill was about 4 mm longer and 2 mm higher than bills of nearby Californias; upper and lower outlines nearly parallel as in California, but culmen very slightly recurved in middle to produce a very slightly bulbous tip; gonydeal angle very weak; compared to adult Western's bill, shorter and much shallower (hence also proportionately shallower), tip less bulbous, and gonydeal angle much less pronounced. **Head streaks** (do not show clearly in photographs): head white with narrow, sharply defined, rather short, longitudinal streaks of dark gray on crown and face, lengthening, widening and blurring on nape and hindneck; reminiscent of those of winter adult Ring-billed Gull *(L. delawarensis)* but less sharp and numerous, and spots of latter species lacking. **Underparts and tail:** solid snow white, with no suggestion of darkening that would indicate immaturity. **Mantle:** Dark Neutral Gray (capitalized colors from Ridgway 1912; see beyond), paler than jet black of wing tips and about same "shade" (see beyond) as upper back (with daylight reflections) of nearby American Coots; a half-shade darker than in nearby adult *L. o. wymani*; a full shade darker than in nearby adult *L. o. occidentalis*; two shades darker than in adult Californias; no tinge of brown could be seen; scapulars broadly tipped with white. **Primaries:** above and below dark gray, distally above jet black with white apical spots; outermost (10th) crossed by a subterminal white mirror (band) about as wide as long, well separated (by about width of mirror) from apical white, embracing both webs, and slightly indented both proximally and distally along rachis; no white tongues or mirrors visible on 9th or other primaries when tips spread in preening or flying, although we could have missed a small white spot on the 9th; wing tips extended well beyond tail tip. **Secondaries:** above dark gray like mantle, with broad white tips; below (as seen in flight) gray, about as in adult Western or perhaps even darker, with broad white tips;

wing linings white. **Bill color:** yellow with a bright red, orange-tinged gonydeal spot, near Scarlet-Red, confined to lower mandible, not reaching tip or tomium, and very large – about twice as long as high (shape unique in my experience) and thus nearly twice the size of a Western's. **Eye:** irides very pale yellow with a few flecks of dusky according to our field notes, but nearly grayish-white, tinged yellowish, in slides; in proportion to head size, eye seemed about same size as California's and larger than Western's. **Eyelid color:** bright red, the exact shade somewhat obscured by shadow of brow but seeming in field and slides slightly darker and less orange than gonydeal spot and near Spectrum Red. **Leg and foot color:** tarsi and toes buffy-yellow, not a pure yellow nor tinged with greenish or pinkish, close to Buff-Yellow; color unique in my experience with gulls; web color not noted. **Voice:** none heard.

IDENTIFICATION

Similarity to L. fuscus graellsii. The Monterey bird was identical to a typical winter adult *L. f. graellsii* in all characteristics.

Witherby et al. (1941) state that *graellsii* ends its molt in January with replacement of the outer primaries, the condition exhibited by the Monterey bird. Judging from the fragmentary literature on this subject, most other large gulls terminate their basic molt in fall, while molt in the Kelp Gull *(L. dominicanus)* is at its height in January and February.

Ridgway (1912) presents a standard color scheme with which mantle colors, very important to identification, can be compared. He pictures six shades of gray between white and black: Pallid Neutral Gray, Light Neutral Gray, Neutral Gray, Deep Neutral Gray, Dark Neutral Gray, and Dusky Neutral Gray. I term these "full shades." The colors halfway between I term "half-shades," which are easily seen both in the field and hand when comparisons are available. In the forms with which I am concerned herein, individuals vary no more than a quarter-shade on each side of the average, or a total of one half-shade. All mantle colors mentioned herein were determined from specimens, as many literature designations, even those using Ridgway colors, were found to be untrustworthy.

In Figure 1, the reader may compare the mantle of the Monterey bird, judged to be Dark Neutral Gray, with those of adult California Gulls (Neutral Gray), a second-year *L. o. occidentalis* (between Neutral Gray and Deep Neutral Gray; second-year birds are about a half-shade paler than adults), and an American Coot (upper back Dark Neutral Gray but appearing darker in slide). To test our visual judgment of mantle colors, I took light meter readings of museum study skins of various species, including the California Gull, and correlated these with Ridgway colors. I then took readings of the slide images of Californias and the Monterey Lesser Black-backed and calculated a "specimen value" for the latter. This figure was the same as that for the coot's upper back (Dark Neutral Gray), a half-shade darker than in *L. o. wymani*, and a half-shade paler than in the Slaty-backed Gull *(L. schistisagus)*, thus closely matching our visual impression.

Witherby (1914) gives an excellent color plate of the head of an adult summer *graellsii*. Our bird matched this plate almost exactly in bill proportions, gonydeal spot color, shape and extent, iris and eyelid colors, and eye-head proportions. In the Monterey bird, however, the gonydeal angle was slightly less pronounced (more like the third-winter bird pictured), and the ground color of the bill was much yellower, less orange; this latter difference probably is a reflection of the more advanced breeding condition of the pictured bird.

Barnes (1952), in discussing the great variation in winter adult leg color in *graellsii*, states that many immigrants to England in late February and March have legs of "rich ochre yellow," a phrase that except for the word "rich" would well describe the Monterey bird.

Elimination of similar forms. Despite the fact that the Monterey bird seemed identical to *L. f. graellsii*, I deemed it necessary to eliminate all other gulls of the world, because Monterey is well outside even the known vagrancy range of that form. This required elimination on the subspecific level, as several races of Herring Gull are similar to the Lesser

Figure 1. Adult British Lesser Black-backed Gull *(Larus fuscus graellsii*; darkest-mantled bird, left center) at Monterey, California, 14 January 1978. Also shown are a second-winter Western Gull *(L. o. occidentalis*; left foreground), American Coot *(Fulica americana)* and California Gulls (*L. californicus*; remainder of gulls).

Photo by Ronald L. Branson

Black-backed Gull. I made a thorough search of the widely scattered literature and examined specimens in the California Academy of Sciences, Museum of Vertebrate Zoology, Berkeley, and some from the National Museum of Natural History, Washington, D. C. Eugene Eisenmann kindly provided comments based on the collection of the American Museum of Natural History, New York, and Jon Winter loaned photographs of the Kelp Gull.

This paper treats only those forms that are likely to be confused with *graellsii* or are grossly similar but might be unfamiliar to the reader. Table 1 lists the characters that distinguish the most similar forms (those with mantles darker than Neutral Gray) from the Monterey bird (and hence from *graellsii*). The less similar forms are discussed below.

Four similar species, the Kelp Gull, Great Black-backed Gull *(L. marinus)*, Slaty-backed Gull and Western Gull, were easily eliminated by their characters as listed in Table 1. Thayer's Gull *(L. thayeri)* differs markedly from the Monterey bird in its dark pink legs and feet, magenta eyelids, darker irides, much paler mantle (between Pale and Light Neutral Gray), and white wing tips ventrally.

The Holarctic Herring-Lesser Black-backed *(argentatus-fuscus)* group, which is much discussed but poorly understood, caused the greatest difficulties. The prevalent school of thought (e.g. Vaurie 1965) holds that there are only two Lesser Black-backed Gulls in the world, *graellsii* and nominate *fuscus*, while the remaining ten or so forms are subspecies of *L. argentatus*. On the opposite end of the spectrum, some authors (e.g. Voous 1960) believe that there are only two Herring Gulls, *smithsonianus* and nominate *argentatus*, while all other forms are subspecies of *L. fuscus*. Some authors (e.g. Stegmann 1934) consider the two species conspecific, even though they are sympatric over parts of their ranges. Dwight (1925) takes an intermediate position, treating the "Yellow-legged Gull," *cachinnans*, as a separate species, *vegae* and *thayeri* as races of *L. argentatus*, and *taimyrensis* and *atlantis* as subspecies of *L. fuscus*; his monograph, however, loses considerable usefulness because it does not deal with all presently recognized forms of the complex.

For the purpose of identifying the Monterey bird, I have taken the most conservative view, that of Vaurie (1965), who recognizes two races of the Lesser Black-backed Gull, *L. f. graellsii* (Iceland, British Isles) and *L. f. fuscus* (Scandinavia, northwestern Russia), and ten subspecies of the Herring Gull, divided into two groups. Included in the northern circumpolar group of Herring Gulls, listed from west to east, are: *a. argentatus* (Iceland, British Isles, Scandinavia, northwestern Russia; includes *argenteus* and *omissus*); *heuglini* (northern Russia, northwestern Siberia; includes *antelius*); *taimyrensis* (north-central Siberia); *vegae* (northeastern Siberia; includes *birulae*); and *smithsonianus* (North America). The southern group, listed from west to east, includes the following: *atlantis*

(Azores, Canaries); *michahellis* (Mediterranean); *armenicus* (Armenia); *cachinnans* (middle East, southwestern Siberia; includes *barabensis* and *ponticus*); and *mongolicus* (Mongolia, Manchuria). The above ranges are very incomplete; the reader may consult Vaurie (1965) for details.

Of the ten Herring Gull races, only *argentatus* and *smithsonianus* consistently have pink legs and feet. In *heuglini, atlantis*, *michahellis*, *cachinnans* and *armenicus*, these parts are always some shade of yellow, while *taimyrensis*, *vegae* and *mongolicus* may have either color (Vaurie 1965).

The Herring Gull races *smithsonianus*, *argentatus*, *taimyrensis*, *vegae*, *michahellis*, *armenicus*, *cachinnans* and *mongolicus* were easily eliminated by their pale mantles, which range from Pallid Neutral Gray to Neutral Gray and thus are at least two shades paler than that of the Monterey bird. Additional distinguishing characters are as follows: *smithsonianus* and *argentatus* have orange eyelids and pink legs and feet; *taimyrensis* is said to have orange to orange-vermilion eyelids, little or no winter head streaking, and a larger body; *vegae* is larger in body bulk; *michahellis* is sedentary and usually has a slightly larger mirror on the 10th primary; *armenicus* has a very small population (and may not be a valid race) and is sedentary; *cachinnans* has the head streaking absent or restricted to the hindneck and completes its basic molt in the fall; and *mongolicus* is considerably larger in body and bill.

The remaining two races of Herring Gull, *heuglini* and *atlantis*, are the forms most similar to the Lesser Black-backed Gull, but nevertheless can be eliminated with certainty on the basis of their paler mantles and the other distinguishing characters listed in Table 1.

Separation of *graellsii* from nominate *fuscus* is, of course, difficult in the field, but I believe possible in typical birds. In the latter race, the mantle is one shade darker, nearly as dark as the primary tips (Witherby et al. 1941), and slightly tinged with brown to produce a shade of Fuscous rather than Neutral Gray. Also, in *fuscus* the "Head and neck in winter [are] considerably less streaked" (Witherby et al. 1941).

DISCUSSION

Every characteristic of the Monterey bird perfectly matches typical examples of *L. fuscus graellsii*, and every other gull form in the world is eliminated by two or more characters.

Despite the unusual locality, our conclusion is supported also geographically, as none of the three most similar forms *(L. f. fuscus*, *L. a. heuglini* and *L. a. atlantis)* has been definitely recorded in North America, whereas *graellsii* has. Furthermore, the Lesser Black-backed Gull seems to be undergoing rapid expansion in North America, although the recent increase in records may be at least in part a function of improved awareness and coverage on the part of observers. In recent years, *L. fuscus* has been reported more frequently in Texas (Watson and Goldman

Table 1. Characteristics of selected adult winter gulls that distinguish them from the British Lesser Black-backed Gull *(Larus fuscus graellsii)*, including the one photographed at Monterey, California on 14 January 1978. Key: N. = Neutral; G. = Gray; g. a. = gonydeal angle.

Lesser Black-backed Gull	
L. fuscus fuscus	Head streaks fewer or absent; mantle one shade darker and tinged brown (dusky Fuscous-Black [= Dusky N. G.]) and nearly as dark as primary tips.
Herring Gull	
L. argentatus heuglini	Head streaks on hindneck only; mantle one shade paler (Deep N. G.); basic molt ends Sep.-Oct.
L. a. atlantis	Mantle 1½ shades paler (between N. G. and Deep N. G.); iris perhaps amber; eyelids perhaps orange; sedentary.
Kelp Gull	
L. dominicanus	Forehead more sloped; bill actually and proportionately higher; g. a. usually much stronger; head streaks absent or on crown only; mantle two shades darker and tinged brown (very dusky Fuscous-Black [= nearly Black]) and as dark as primary tips; gonydeal spot rounder and extends to tomium and almost to tip; legs and feet variable but usually with greenish tinge; basic molt at height (old feathers worn) in Jan.-Feb.
Great Black-backed Gull	
L. marinus	Body much larger; forehead more sloped; bill actually much longer and higher and proportionately higher; g. a. much stronger; head streaks fewer or absent; mantle one shade darker and tinged brown (dusky Fuscous-Black [= Dusky N. G.]); mirror on 10th primary merges or nearly merges with white apical spot; mirror on 9th primary large; eyelid color somewhat more orange; legs and feet pink; basic molt ends in fall; eye smaller relative to head.
Slaty-backed Gull	
L. schistisagus	Body much larger; bill actually longer and higher and proportionately higher; g. a. stronger; mantle one half-shade darker (between Dark and Dusky N. G.); mirror on 10th primary larger and nearly merging with white apical spot; usually large mirror on 9th primary; white tongues on 8th-6th primaries; legs and feet pink to reddish; basic molt ends in fall; eye smaller relative to head.

Table 1 (cont)

Western Gull	
L. occidentalis, all races	Body larger; forehead more sloped; bill actually longer and much higher and proportionately higher; g. a. much stronger; bill tip more bulbous; gonydeal spot smaller and rounder; basic molt ends in fall; eye smaller relative to head.
L. o. occidentalis	Head streaks usually absent, or when present, wide and not sharp; mantle one shade paler (Deep N. G.); iris darker, richer amber-yellow; eyelids rich orangish-yellow; legs and feet pink.
L. o. wymani	Head streaks absent; mantle one half-shade paler (between Deep and Dark N. G.); iris darker, richer amber-yellow; eyelids rich orangish-yellow; legs and feet pink.
L. o. livens	Head streaks absent; mantle one half-shade paler (between Deep and Dark N. G.); iris clear, unflecked lemon yellow; eyelids lemon yellow.

1952; Webster 1970, 1977) and Florida (Woolfenden and Schreiber 1974; Stevenson 1976); appeared once in Colorado (Denver, 11 Dec. 1976-1 Jan. 1977; Webb and Conry 1978); and has become regular enough in the northeast (Buckley et al. 1977), middle Atlantic coast (Scott 1977), and southern Atlantic coast (Teulings 1976) that it no longer merits great attention. Godfrey (1966) did not list the species for Canada, but it has since been noted in the Northwest Territories (near Albert Edward Bay on Victoria Island, 17 July 1972; Alsop and Jones 1973), Manitoba (5 June 1968; Ross and Cooke 1969), Quebec (David and Gosselin 1977), and Ontario (twice) and Nova Scotia (Alsop and Jones 1973).

Currently, the Lesser Black-backed Gull is considered primarily a winter visitor in North America; it is not known to nest closer than Greenland. It may, however, be following the same historical pattern as the Little Gull *(L. minutus)* and perhaps Black-headed Gull *(L. ridibundus)*, both of which invaded eastern North America, slowly then rapidly increased in number, established breeding colonies, and are now appearing with increased regularity on the Pacific coast (Winter and Manolis 1978). The Lesser Black-backed invaded in the 1930s, increased slowly at first, then rapidly in the last 10 years, and recently has occurred a few times in summer. The Monterey bird may well be a forerunner of a Pacific coast invasion.

The adult age suggests that our bird had visited Monterey in previous years, either as a transient or winter resident. Most winter residents, including vagrants, occur first as juveniles and then return to the same area in subsequent winters. Such behavior in *L. fuscus* is demonstrated by

the Texas City Dike, Texas, bird that appeared during three consecutive winters (Webster 1970), and the Digby, Nova Scotia, bird that has wintered for the last 8 years (Vickery 1977). The Monterey individual should be sought in future years, especially (in case it is a transient) in mid-January.

The unworn plumage and absence of leg bands argue against an escape, and I doubt there are any captive *L. fuscus* in North America. The aspect of the bird gives no indication of hybrid origin. The combination of body and bill size, mantle, leg, and eyelid color, and primary pattern rule out any geographically and/or biologically reasonable hybrid combination. That a hybrid would be identical to *graellsii* is also very unlikely.

Identification of adult dark-mantled gulls of the world is difficult but not impossible, given an exhaustive description made at close range and preferably supported by color transparencies; softpart colors, head shape and body bulk, not visible in study skins, are very useful. West coast observers encountering an unknown dark-backed gull should note in extreme detail as many of the following characteristics as possible: shade of mantle compared to all nearby adult gulls, especially the Western Gull; shapes of head and bill, including the development of the gonydeal angle and the overall height of the bill in relation to its length; color and shape of the gonydeal spot; color of the irides, legs, feet and especially eyelids; width, sharpness and distribution of head streaks, and if possible the pattern of white on the outer primaries, especially the size and location of mirrors and the extent of white or gray tongues on the inner webs.

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STATUS OF THE BLACK RAIL IN CENTRAL CALIFORNIA

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The California Black Rail *(Laterallus jamaicensis coturniculus)* is classified "Rare" by the California Fish and Game Commission, but this secretive rail's status always has been difficult to assess. Wilbur (1974) and Gill (1977) concluded that records of singing birds in spring and immatures in late summer indicated probable breeding by Black Rails in the San Francisco Bay area. Within recent years, calling Black Rails were located in spring and summer in Solano, Napa and San Joaquin counties (Jurek 1976, Department of Fish and Game files). These findings prompted this study, which began 25 March 1977 and concluded on 14 July 1977. Its purpose was to clarify the status of the species in northern and central California and attempt to identify its habitat requirements.

METHODS

Census sites were selected based on the historical distribution of Black Rails in central California. An attempt was also made to census as wide a variety of different marsh types as possible. Censusing involved walking through or adjacent to suspected Black Rail habitat while playing tape-recorded Black Rail calls in an attempt to elicit responses from birds on territories. Calls were broadcast using a cassette tape recorder connected to a 15 watt power horn. A standard census tape, with alternating "grr" and"kic-kic-kerr" call sequences (Repking and Ohmart 1977) separated by 1 minute pauses, was used most frequently, particularly during the first visit to a site. Information recorded for each site censused included: date, time, weather, habitat description, number and kinds of responses and other relevant data. The locations of calling birds were plotted on photocopies of U.S. Geological Survey topographic maps. A number of visits to representative marshes around San Francisco Bay were made during peak high tide periods in late May and June to view the effects of these tides on the habitat.

DISTRIBUTION

At least 32 Black Rails were heard during this survey in 14 localities in the northern San Francisco Bay area and the delta of the Sacramento-San Joaquin river system. Only one Black Rail was seen. Twenty-two of the birds found in this area were in marshes bordering San Pablo Bay or the river systems (Napa and Petaluma) that empty into San Pablo Bay from the north. No Black Rails were found in marshes bordering the Pacific Ocean, or in San Francisco Bay south of the Richmond-San Rafael Bridge (Figure 1). Seven Black Rails were heard in a census of marshes bordering Morro Bay, San Luis Obispo County, on 14 and 15 April.

The following area-by-area review of the past and present distribution of Black Rails in northern and central California is based primarily on the results of this study and the following sources: Wilbur (1974); specimens in the Museum of Vertebrate Zoology (MVZ), Berkeley, and

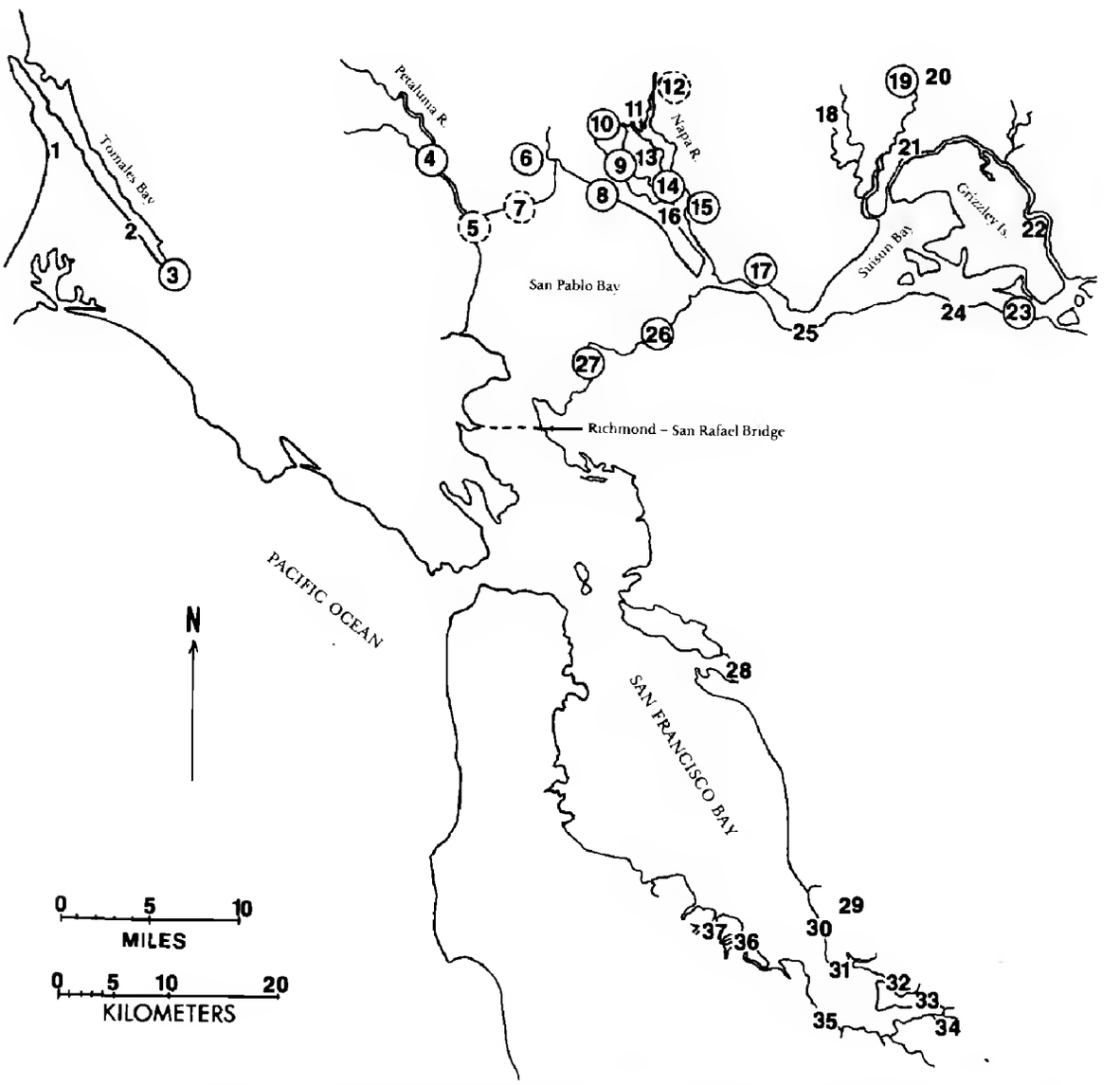

Figure 1. Locations where Black Rails were heard (numbers in solid circles) and searched for but not found (uncircled numbers) in the San Francisco Bay area, California, during spring and summer 1977. Broken circles indicate where birds were heard by others in 1976 and 1977 (see text). Locations are: 1 = Kehoe Marsh; 2 = Inverness; 3 = Olema Marsh; 4 = San Antonio Creek mouth; 5 = Black Point; 6 = Tolay Creek; 7 = Midshipman's Pt., Tubbs I.; 8 = north shore San Pablo Bay; 9 = South Slough; 10 = Napa Slough; 11 = Fly Bay; 12 = Fagan Slough; 13 = China Slough; 14 = South Slough mouth; 15 = White Slough; 16 = Dutchman's Slough; 17 = Southampton Bay; 18 = Cordelia (vicinity); 19 = Peytonia Slough; 20 = Duck Slough; 21 = Joice I.; 22 = Grizzley I.; 23 = Mallard I.; 24 = Port Chicago (vicinity); 25 = Martinez Marina; 26 = Pinole; 27 = Pinole Pt.; 28 = San Leandro Bay: 29 = Coyote Hills Regional Park; 30 = Ideal Cement Marsh; 31 = Dumbarton Pt.; 32 = Mowry Slough; 33 = Albrae Slough; 34 = Triangle Marsh; 35 = Palo Alto Baylands; 36 = Greco I.; 37 = Corkscrew Slough, Bair I..

the California Academy of Sciences (CAS), San Francisco; *Audubon Field Notes* (AFN) and *American Birds* (AB); and information obtained by Department of Fish and Game personnel and compiled in the Department's California Black Rail file in Sacramento (DFG.)

WESTERN MARIN COUNTY. Black Rails were frequently collected during high flood tides in the fall and winter (September through February) in salt marshes on the edge of Tomales Bay near Marshall and Point Reyes Station from 1897 to at least 1940 (Wilbur 1974, MVZ, CAS), and one was observed during a high tide at the head of the bay on 5 February 1974 (DFG). From 1965 to 1967, one pair inhabited a small, brackish marsh near Inverness and apparently bred, as chicks were reported seen one summer (AFN 21:73, 1967; Gerald Brady pers. comm.). Salt marshes around Tomales Bay, not checked in this study, may yet harbor nesting Black Rails. Black Rails have been found at Kehoe Marsh and Olema Marsh between October and February and have been heard calling at Olema Marsh in April and May in recent years (AB 29:903, 1975;DFG). In this study, one was calling at the upper end of Olema Marsh on 5 April 1977, and it is possible that they breed at this location. A Black Rail collected at Elk Valley on 13 March 1945 (MVZ) was probably a migrant or non-breeding wanderer.

PETALUMA RIVER MARSHES. No records from these marshes existed prior to this study. Six birds were heard at the mouth of San Antonio Creek, Marin and Sonoma counties on 4 May 1977, indicating that a potentially large, previously unsuspected population inhabits these marshes.

NAPA RIVER MARSHES. There appear to be no records for these marshes prior to 1976;two responded to taped calls near Fagan Slough, Napa County, on 14 July of that year (DFG). In this study, Black Rails responded to taped calls at five locations in the Napa Marshes: a minimum of three birds along Tolay Creek, Sonoma County; one along Napa Slough, Napa County; one along South Slough and two to three along the Napa River at the mouth of South Slough, Solano County; and one at the mouth of White Slough, Solano County. A substantial breeding population is indicated.

SAN PABLO BAY MARSHES. Prior to the 1970s, there seem to have been no records of Black Rails around this bay. Five were seen at the mouth of Gallinas Creek, Marin County, on 11 December 1973; one was seen there on 7 January 1974, and one was seen at Pinole, Contra Costa County, on 19 November 1975 (DFG). An abandoned nest, reportedly of this species, was found at Pinole in fall 1976 (AB 31:1184, 1977). A single bird was seen or heard at Midshipman's Point, Tubbs Island, Sonoma County, on 14 and 26 February, 21 July and 10 September 1977 (Gail Scott and Jack Arnold pers. comm.); two birds were found there 19 May 1978 (AB 32:1050, 1978); and a calling bird was at Black Point, Marin County, on 24 May 1977 (Robert M. Stewart pers. comm.). During this study, at least three singing birds were heard in a marsh at Pinole, Contra Costa County; a single bird was heard at Pinole Point, Contra Costa County; and at least three birds were heard in a section of the extensive marsh bordering the northeast shore of San Pablo Bay in Solano County. Much of the remaining marsh fringing San Pablo Bay appears suitable for Black Rails.

SOUTHAMPTON BAY MARSH. Two were observed in this marsh on 2 April 1958 (AFN 12:383, 1958) and there have been numerous sightings during high winter tides since 1973 (AB regional files, DFG). One was heard in the marsh on 22 May 1975 (Roberson 1975) and single calling birds were heard on 2 and 26 June 1976 (DFG). During frequent censusing in summer 1977, as many as three birds were calling at one time, and four pairs were estimated present (Frank Beyer pers.comm.). One found in nearby Benicia, Solano County, on 18 July 1941 (Stoner 1945) was probably a migrant or post-breeding wanderer.

SUISUN MARSHES and NORTHERN CONTRA COSTA COUNTY. Black Rails were collected in the Suisun Marshes, Solano County, on 11 September 1913, 19 October 1910 and 15 January 1911 (MVZ). Individuals were reported seen on 13 December 1975 and 29 December 1976 near Cutoff Slough, and 28 December 1974 near Suisun Slough, both in Solano County (*fide* Frank Beyer pers. comm.). In Contra Costa County there is an old winter record for Martinez (Grinnell and Wythe 1927) and there are recent (1975-76) winter sightings, probably valid, near Port Chicago (DFG). During this survey, one Black Rail was heard at Peytonia Slough, Solano County, on 5 July 1977 and two or three birds were heard and one was seen on Mallard Island, Contra Costa County, on 2 July 1977. An immature Black Rail was found dead near Peytonia Slough on 11 August 1977 (DFG). Three calling Black Rails were in a marsh bordering the Big Break near Oakley, Contra Costa County, on 18 May 1978 (AB 32:1050, 1978). Black Rails apparently breed in the limited suitable habitat remaining in this area.

SAN FRANCISCO BAY. Black Rails were frequently collected in fall and winter (October through February) at Alameda, Bay Farm Island and Newark, Alameda County; Alviso and Palo Alto, Santa Clara County; and Redwood City, San Mateo County, between 1892 and 1913 (Wilbur 1974, CAS, MVZ). Sight records in the years since have been in approximately the same areas in the same months (AB regional files, DFG). There is one definite specimen (CAS 208), and another possibly mislabeled (bearing two conflicting specimen labels, CAS 207 and 12938), for Palo Alto on 24 May 1930. One was seen along Belmont Slough, San Mateo County, in August 1972 (Barry Sauppe pers. comm.) and another was seen on 7 August 1958 at Dumbarton Point, Alameda County (AB regional files). Wheelock (1916) claimed, without presenting evidence, that Black Rails nested at Alviso. A nest with eggs collected near Newark in 1911 is the first proof of nesting by Black Rails in northern California (Kiff 1978). Black Rails were not found in marshes around San Francisco Bay proper during this study, and the lack of suitable habitat (high marsh) indicates that they may no longer nest around this bay. There are two specimens from north San Francisco Bay, both in Marin County: one found dead near Manzanita on 11 August 1929 (MVZ) and one from Kentfield on 8 February 1932 (CAS). High marsh habitat in this area has been reduced greatly since the time of these records.

Of 12 records of Black Rails away from tidal marshes in the San Francisco Bay region, 6 are from San Francisco, 2 are from upland sites in Alameda County and 4 are from the Farallon Islands (Wilbur 1974, CAS and MVZ). Six of the mainland records are for the period August through October and suggest migration or post-breeding wandering.

CENTRAL VALLEY. Belding (1879) vaguely recollected possibly collecting a Black Rail near Stockton, San Joaquin County, in the mid 19th century. One was found dead near there on 26 August 1959 (Arnold 1960). Department of Fish and Game personnel discovered Black Rails calling in summer 1974 in a marsh near Lodi, San Joaquin County, and three were heard there during this study. Although suitable habitat is fairly limited there now, Black Rails should be expected elsewhere in the Sacramento-San Joaquin Delta where high, tidal marsh occurs. One other definite record exists for the Central Valley; a bird, most likely a.vagrant, was found dead at Gray Lodge Wildlife Management Area, Butte County, in March 1962 (AFN 23:516, 1969). Sightings have been reported from Colusa (AB regional files) and Yolo (Kimball 1974) counties, but breeding season surveys at Sacramento National Wildlife Refuge, Glenn County, at Gray Lodge, and at Los Banos Wildlife Area, Merced County, have yielded negative results in recent years (DFG).

MONTEREY BAY. Black Rails were collected at Santa Cruz, Santa Cruz County, on 19 July 1930 and 25 August 1941 (MVZ), and one was found dead there in September 1903 (Emerson 1904). One was found dead in Pacific Grove, Monterey

County, on 29 September 1967 (Vernal Yadon pers. comm.). These are probably records of post-breeding wanderers or migrants.

MORRO BAY. A Black Rail was collected in Morro Bay, San Luis Obispo County, on 22 April 1961 (AFN 15:439, 1961); one was found dead there on 18 December 1972 (Aryan Roest pers. comm.); and singles were seen there 30 November 1968 (AFN 23:107, 1969) and 2 January 1969 (AFN 23:521, 1969). Seven Black Rails were heard in marshes around Morro Bay during this study, and the evidence points to a resident population.

HABITAT

Grinnell and Miller (1944) described the habitat preferred by Black Rails as "chiefly tidal salt marshes, where associated characteristically with heavy growths of pickleweed *(Salicornia)*. But also occurs in brackish and freshwater marshes . . ." This study confirmed their description. Thirty-seven of the 39 Black Rails found were in marshes dominated by either *Salicornia virginica* or bulrush (*Scirpus* spp.), and 7 of the 13 birds in *Scirpus*-dominated marshes were in or near parts of the marsh where *Salicornia virginica* was present and fairly abundant. The types of *Scirpus* frequented by Black Rails are low-growing forms (e.g., *S. americanus* at the Big Break, Contra Costa County; David Gaines pers. comm.) found in the higher parts of marshes. The bird at Peytonia Slough was in an area where matted salt grass *(Distichlis spicata)* merged with a stand of cattails (*Typha* sp.) and *Scirpus*, and the bird in Olema Marsh was calling from a stand of *Typha*. The frequent association of Black Rails with pickleweed is probably a reflection of their preference for high marshes, but the importance of pickleweed, and possibly salt grass, as sources of nesting materials and substrates remains to be examined.

Except for the bird at Olema Marsh, all Black Rails found in this study were in tidal marshes. Areas within these marshes where Black Rails were heard are near the upper limits of tidal flooding. No Black Rails responded in salt or brackish marshes that are no longer under tidal influence (e.g., Figure 1: sites 18, 20, 21 in part, 22, 29), or in low marshes that are dominated by *Scirpus* spp. (sites 11, 21 in part, 34) or *Salicornia virginica* and/or *Spartina foliosa* (sites 28, 30, 31, 32, 33, 35, 36, 37) but are frequently covered by high tides.

Post and Enders (1969) hypothesized that Black Rails find tidal marshes more attractive than diked marshes with similar vegetation possibly because of higher food resource levels in tidal marshes. Little is known about Black Rail food habits (Wilbur 1974) but apparently they feed on arthropods (Huey 1916). The variety and abundance of arthropods in a marsh are probably affected considerably by the frequency and magnitude of water level fluctuations in the marsh. Black Rails found in this study were often in the immediate vicinity of tidal sloughs, indicating a concentration of activity in this part of the marsh. These sloughs teem with invertebrates, a feature noticeably lacking in diked marshes.

In a survey of marshes along the lower Colorado River, Repking and Ohmart (1977) found a definite relationship, similar to that observed in this study, between Black Rail distribution and marsh elevation. They found Black Rails in high, shallow water marshes with little annual and/or daily fluctuations in water level, but not in low, deep water marshes or marshes with considerable fluctuations in water level. Ingersoll (1909), Huey (1916) and Stephens (1919) found evidence of profound effects by high tides on Black Rail populations, and Grinnell and Miller (1944) felt that the "most important hazards to existence [of Black Rails] on salt marshes appear to be extra high tides."

The fact that Black Rails were not found around San Francisco Bay proper in this study may reflect the lack of high marsh habitat around this bay. Many areas of salt marsh in south San Francisco Bay have subsided in the past quarter-century because of human removal of ground water (Conradson 1966) and large tracts of low-lying marsh in this area abut abruptly against salt pond dikes and other human-made structures, instead of gradually merging into upland habitats as they formerly did. Nearly all the remaining salt marsh in the south bay is completely covered by peak high tides, and often extensively flooded by even moderately high tides (*fide* San Francisco Bay National Wildlife Refuge personnel, pers. obs.). Similarly, in areas such as the Suisun Marshes and the Sacramento-San Joaquin Delta, where dikes have reclaimed much tidal marshland and left only narrow borders of deep water tidal marsh, Black Rails were probably much more common in the past than at present. Suitable high marsh vegetation for nesting, then, appears to be the most limiting factor in determining the current distribution of breeding Black Rails in the San Francisco Bay area.

This study was conducted during a severe drought in northern California. A major effect of the drought was an increase in salinity levels throughout the Sacramento-San Joaquin Delta and San Francisco Bay area. The salinity of marshes in which Black Rails were heard was not measured, but it no doubt varied considerably from very low (Olema Marsh and the marsh near Lodi) to rather high (San Pablo Bay) levels. Salinity did not appear to be a factor affecting the distribution of Black Rails in the area.

This survey found Black Rails in a number of marshes in the San Francisco Bay area, but many bay marshes that may have summer populations of Black Rails have yet to be checked for this species. Effective management programs to preserve suitable nesting habitat for California Black Rails require more survey work and a better understanding of the interrelationships between this species and other elements, living and non-living, of the marsh ecosystem.

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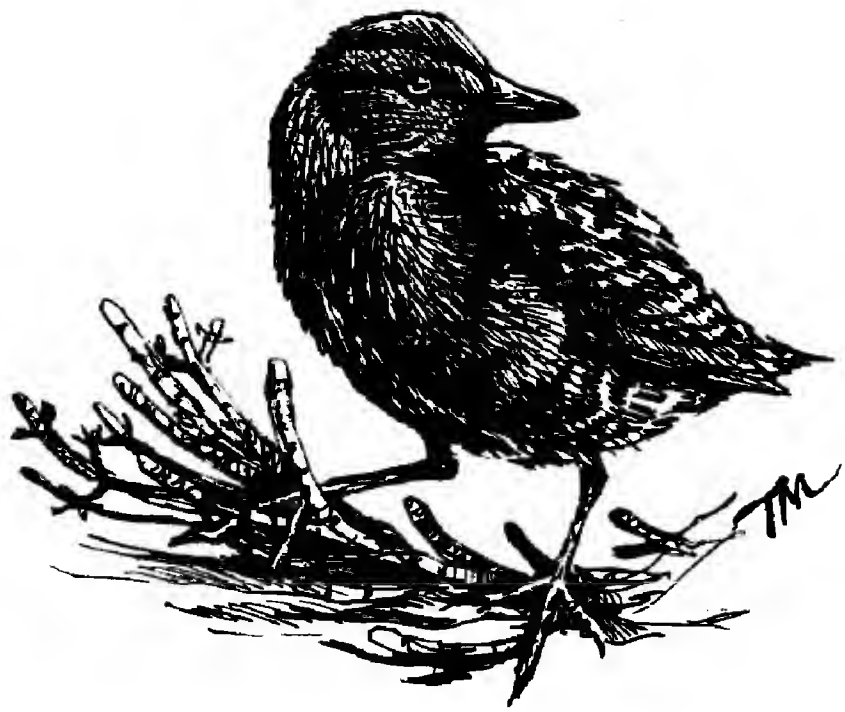

Sketch by Tim Manolis

THE STATUS OF THE NORTHERN SHRIKE IN NEW MEXICO

JOHN P. HUBBARD, 2016 Valle Rio, Santa Fe, New Mexico 87501

The Northern Shrike *(Lanius excubitor)* reaches the southern limits of its regular North American winter range in New Mexico, where it was first reported in November 1846 (Bailey 1928). Although such authors as Bailey (1928) and Ligon (1961) have discussed the species in a general way, no detailed study of its status in that state has ever been done. The present paper presents an analysis of the frequency and season of occurrence, numbers, distribution, habitat selection, age/sex ratios and subspecific allocation of the Northern Shrike in New Mexico.

FREQUENCY OF OCCURRENCE

To date, records of the Northern Shrike in New Mexico span 131 winters, from that of 1846-47 through 1977-78. Over this period, this species has been recorded in only 30 (22.9%) of the winters in question (Table 1). This is an average of once every 4.5 winters, with the actual gap between records being 0 to 35 winters. On the basis of 10 year increments, starting in 1846-47, this averages about two winters of occurrence per decade, with the range from zero to nine (Table 2).

There have been no more than four reported winters of occurrence of Northern Shrike in New Mexico in any decade except the most recent one. In that exceptional period, i.e. 1966-67 through 1975-76, there were records in all but one of the 10 years, the exception being 1973-74. In fact, 1973-74 is the only winter over the last 12, i.e. 1966-67 through 1977-78, in which no Northern Shrikes were reported in the state. Contrasted to earlier decades, the most recent decade has seen the known status of the Northern Shrike change from an "occasional" to a "regular" winter visitant, to use the terminology of Hubbard (1978).

The apparent increase in the frequency of occurrence of the Northern Shrike in New Mexico could be an artifact to some degree. There are now more field-trained observers operating in the state than there were through the mid-20th century, and there are also more outlets for publishing sight records. However, the increase in frequency over the last decade contrasts sharply with the immediately preceding decade, 1956-57 through 1965-66, which had no paucity of observers and publication outlets, yet few shrikes were reported. In comparing these two decades, it would appear that the difference in the reported frequency of occurrence in this species is real and not an artifact. In

Table 1. Winters of reported occurrences of Northern Shrikes in New Mexico.

Winter	Number of records	Interval[1] (years)	Winter	Number of records	Interval (years)
1846-47	1	-	1933-40	1	0
1882-83	1	35	1950-51	1	10
1883-84	2	0	1951-52	1	0
1884-85	1	0	1956-57	1	4
1893-94	2	8	1966-67	1	11
1899-1900	1	5	1967-68	1	0
1901-02	1	1	1968-69	6	0
1902-03	1	0	1969-70	4	0
1903-04	1	0	1970-71	4	0
1913-14	1	9	1971-72	5	0
1915-16	3	1	1972-73	2	0
1917-18	1	1	1974-75	1	1
1918-19	3	0	1975-76	5	0
1922-23	1	3	1976-77	26	0
1938-39	1	15	1977-78	49	0

[1]Refers to number of years that elapsed between winters of reported occurrence.

previous decades, the numbers of observers and publication outlets were definitely smaller than since the mid-1950s, and the validity of the number of shrikes reported as an indicator of actual frequency of occurrence is accordingly less.

The status of the Northern Shrike as a regular winter visitant to New Mexico dates from the mid-1960s, whereas the period of occasional occurrence dates back through at least the mid-1940s. Occurrence may also have been more frequent around the turn of the century, as shrikes were recorded in four winters between 1896-97 and 1905-06. This spate of records was followed by a decrease in reports at least through the teens and 20s, years marked by significant ornithological activity in the state by members of the U. S. Biological Survey.

SEASON OF OCCURRENCE

Reports of Northern Shrikes in New Mexico all fall within the 6 month period from October through March (Table 3). The peak month for records is December, which encompasses about a third of all reports. This is to be expected, as National Audubon Society Christmas Bird Counts take many observers into the field at this time of the year.

Table 2. Number of winters of reported occurrence of Northern Shrikes in New Mexico, by decade.

Decade (winter through winter)	Number of winters occurrence reported
1846-47 through 1855-56	1
1856-57 through 1865-66	0
1866-67 through 1875-76	0
1876-77 through 1885-86	1
1886-87 through 1895-96	1
1896-97 through 1905-06	4
1906-07 through 1915-16	2
1916-17 through 1925-26	3
1926-27 through 1935-36	0
1936-37 through 1945-46	2
1946-47 through 1955-56	2
1956-57 through 1965-66	1
1966-67 through 1975-76	9
1976-77 and 1977-78	2

November and February yield only about half as many reports as December, but whether a scarcity of bird observers accounts for this is unknown. Only 3.1% of the reports are from October and 7.0% from March; these are the extreme months in the period of occurrence of Northern Shrikes in New Mexico. The latter figures almost certainly reflect a genuine scarcity of Northern Shrikes in the state during these months, although neither is a period of particularly high activity for observers. The earliest autumn record is 14 October 1977 (Chaves County) and the latest is 22 March 1978 (Mora County); records verified by specimens or photographs are from 23 October 1913 (Colfax County) to 2 March 1969 (Bernalillo County). (See Figure 1 for locations of counties.)

Table 3. Reported occurrences by month of Northern Shrikes in New Mexico.

Month	Number of records
October	4
November	21
December	44
January	31
February	20
March	9
Total	129

NUMBERS

Numbers of Northern Shrikes recorded in New Mexico per winter are shown in Table 1; in most winters the species occurs in very low densities in the state with seldom more than 5 or 6 birds reported in any year. Notable exceptions to this trend are apparent for the winters of 1976-77 (26 records) and 1977-78 (49 records). During these two winters, Northern Shrikes were numerous enough to be termed locally common in some areas. For example, in 1976-77 there were 8 records from Rio Arriba County, and in 1977-78 there were 14 from San Juan, 7 from Valencia and 5 each from Sandoval and Socorro counties.

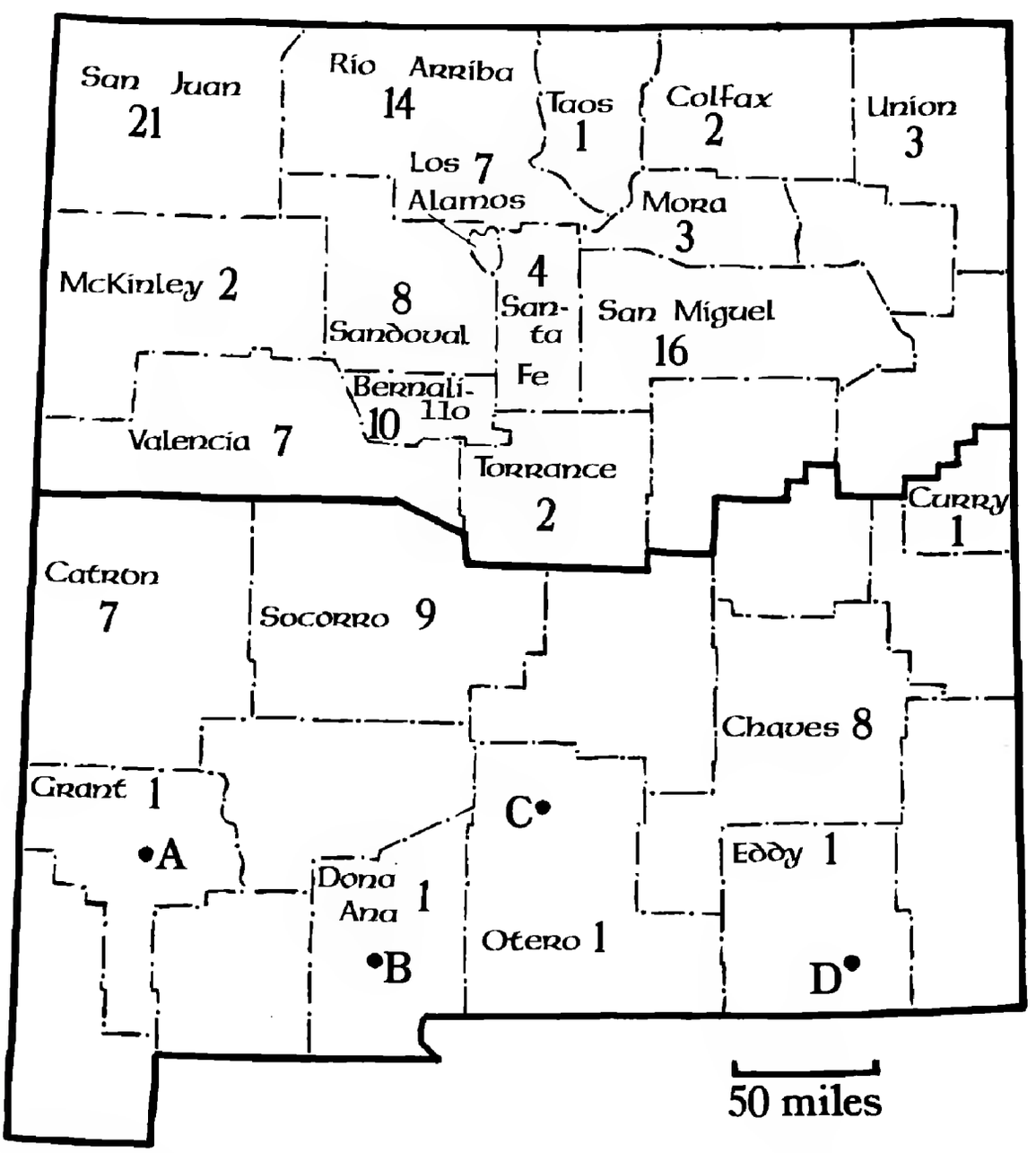

Figure 1. Counties of New Mexico, showing numbers of reported occurrences of Northern Shrikes *(Lanius excubitor)* in each (dark line separates northern from southern half of the state). A=Silver City, B=Las Cruces, C=Las Cruces and D=Loving.

Table 4. Numbers of shrikes recorded from October through March in the northern half of New Mexico in roadside counts.

	1974-75	1975-76	1976-77	1977-78	Total
NORTHERN SHRIKE					
Number seen	1	0	14	25	40
Number/100 miles	.01	0	0.2	0.3	0.1
Miles per shrike	6895	4971+	558	309	685
LOGGERHEAD SHRIKE					
Number seen	55	14	25	33	127
Number/100 miles	0.8	0.3	0.3	0.4	0.5
Miles per shrike	125	355	312	234	216
SHRIKE spp.[1]					
Number seen	52	37	22	28	139
Number/100 miles	0.7	0.7	0.3	0.4	0.5
Miles per shrike	133	134	355	276	183
Total miles, roadside counts	6895	4971	7807	7731	27,404

[1]The vast majority of these were certainly Loggerheads.

Another way of looking at numbers of Northern Shrikes recorded in New Mexico is from roadside counts compiled by the New Mexico Department of Game and Fish (Table 4). In the northern half of the state (see Figure 1) between October and March, a total of 40 Northern Shrikes was counted in 27,404 miles from 1974-75 through 1977-78. This is about 0.1 shrike per 100 miles, or one shrike per 685 miles. Loggerhead Shrikes averaged about 0.5 per 100 miles, or one per 216 miles. Unidentified shrikes (almost certainly dominantly Loggerheads which were too poorly seen to identify to species) averaged about 0.5 per 100 miles, or one per 183 miles. These figures show that Northern Shrikes were identified only about 20% as often as Loggerheads, and if most unidentified shrikes were of the latter species, then Northerns were even rarer, i.e. less than 10% as frequent. In two winters (1974-75 and 1975-76), Loggerheads out-numbered Northerns 69:1 among identified shrikes, whereas in the two most recent winters the disparity decreased to 1.5:1.

DISTRIBUTION

It is obvious, and not unexpected, that the bulk of the records of Northern Shrikes in New Mexico are from the northern half of the state (Figure 1). Of the 129 records, 100 (76.9%) are from the north; an additional 25 records are from the next more southerly quarter of the

state, whereas only 4 are from the southernmost quarter. In general the records are concentrated in the northwestern quadrant, but coverage in the northeast has not been extensive, especially in the foothills of the Rocky Mountains where the birds are more likely to occur. Southward, Northern Shrikes occur most regularly to the Mogollon Plateau (e.g. Catron County) and along the Rio Grande and Pecos valleys, southward to the respective vicinities of Socorro and Roswell. Single records farther south are from the areas of Silver City, Grant County; Las Cruces, Dona Ana County; Tularosa, Otero County; and Carlsbad, Eddy County. All but the last of these records are verified by photographs or specimens.

HABITAT SELECTION

Where habitat data are available for occurrences of Northern Shrikes, there is a frequent association of this species with rather open wooded habitats. Most frequent are pinyon-juniper and lowland riparian woodlands, with occasional occurrences in open Ponderosa Pine *(Pinus ponderosa)* stands. Occasional birds have been noted in grasslands and low shrublands, but such occurrences appear to be infrequent. These shrikes tend to perch relatively high, including in the tops of trees and on utility lines. Very little study of habits, prey and other aspects of the biology has been done in New Mexico, but the data to date agree generally with observations from farther north.

AGE/SEX RATIOS

Among the 129 records of Northern Shrike from New Mexico, 80 are of birds that were aged by the observer or are ageable. Of these, 49 (61.2%) are classed as adult, versus 31 (38.8%) that are classed as immatures. Twenty-four of these records are based on specimens, which show a 50:50 ratio. Possibly this is somewhat biased, in that the more distinctive immature may be somewhat more often identified and taken by collectors. The age ratio for all records from 1946-47 through 1976-77 shows an adult dominance of 54.8%, whereas in 1977-78 it was 68.4%. The latter figure suggests that in the exceptional winter of 1977-78, a greater than normal incursion of adults occurred into New Mexico.

The sex ratio in a sample of 21 specimens examined by me is 66.7% female. If adults and immatures are segregated, the ratio is 70.0% in the former (n=10) and 63.6% in the latter (n=11). This is an interesting preponderance of females, and it parallels a random sample of Northern Shrikes taken in Michigan. In the latter, 6 of 9 (66.7%) are females; conversely, in a random sample from Idaho, 7 of 10 (70.0%) are males. These data may indicate that females tend to winter more frequently at the periphery of the regular winter range (e.g. New Mexico and Michigan), whereas males may predominate farther north (e.g. Idaho).

SUBSPECIFIC ALLOCATION

Two races of Northern Shrike have been recognized in North America: *L. e. invictus* breeds in the western part of the continent, from Alaska east to Manitoba; and *L. e. borealis* breeds in the eastern part, from Ontario to Labrador (AOU 1957). Winter ranges of these two forms retain this orientation, with overlap occurring in the area between the Great Lakes and the Upper Great Plains. Intergradation between breeding *invictus* and *borealis* is thought (Miller 1931) to occur along the western side of Hudson Bay, with this population moving southward to winter in the overlap zone indicated above.

Based on the above information, one might expect both races and their intergrades to occur in the general vicinity of the Great Plains, including in New Mexico. Recent literature, in fact, suggests that such is the case, as *borealis* is listed from Oklahoma (Sutton 1967), *invictus* from Colorado (Bailey and Niedrach 1967) and Texas (Oberholser 1974), and both races in Kansas (Johnston 1965). In order to examine the question of populational occurrence in New Mexico, I carried out an analysis of the available material of *Lanius excubitor* from there.

Geographic variation in the Northern Shrike in North America seems to have been treated in detail only by Miller (1931), who characterized birds from western populations *(invictus)* as being paler and larger than eastern ones *(borealis)* and in having more white in the tail and superciliary. Miller was hampered in his assessment by small sample sizes, with only 25 adults and 104 immatures available to assess a species that breeds from Alaska to Labrador! In view of this paucity of material, any attempt to use Miller's findings to assess subspecies occurrence in New Mexico will obviously be tentative and subject to future clarification. Furthermore, as indicated below, certain characters by which these races are said to differ are too poorly understood or are too inconsistent to be used for this purpose; therefore, I have not used them in deciding which names to place on New Mexican material.

To assess supposed differences between the two races, I assembled a series of probable *invictus* (7 adults, 3 immatures) from Idaho and one of probable *borealis* (5 adults, 4 immatures) from Michigan. These two series differed consistently in that adults and immatures of *invictus* are dorsally paler than *borealis*, with the latter group often buffier (less grayish brown) above than their counterparts. Given this assessment, I then compared the available 12 adult and 10 immature specimens from New Mexico with the appropriate age groups in the two series. The New Mexico specimens agreed consistently with *invictus* from Idaho, being dorsally pale in adults and pale and/or buffy in immatures. There were several specimens that were slightly darker than the Idaho birds, these being an adult from Mora County and single immatures from McKinley and Valencia counties. Such specimens could be intergrades of *invictus* with

borealis, but more likely they represent individual variants within the former; none shows any other sign of *borealis* influence. Several birds in a series from San Miguel County are also somewhat dark, but these specimens are soiled, and as a result they cannot be accurately assessed.

Miller's (1931) conclusions that *invictus* averages longer in wing and tail and has more white in the tail than *borealis* are borne out by his data, but the differences are generally small. Thus, in average wing length *invictus* ranges from 0.5 to 4.3 mm greater and in tail length from 1.7 to 4.4 mm greater than *borealis*. Given that the standard deviations range up to 2.1 mm in wing length and 2.8 mm in tail length, it is doubtful that the differences between the two races are significant. In regard to the amount of white in the tail, which Miller calculated as the ratio between tail length and linear extent of white on the inner web of the outer rectrices, the differences range from 4.4 to 9.7 greater in *invictus*. Again, these differences are probably not significant, as standard deviations range up to 5.5. In addition, I have already mentioned that sample sizes – especially of adults – used in compiling these data were very small, and both an increase in the number and the areal distribution of specimens would be apt to undermine differences even further.

The Idaho and Michigan specimens that I assembled show mixed results when compared to Miller's (1931) measurements, at least in rergards to wing length. Six of the 10 Idaho specimens are larger than any of his measurements of *borealis*, while the remaining four fall in the range of overlap; thus, this sample is 60.0% assignable to *invictus* in this character. Three of the nine Michigan specimens are smaller than Miller's *invictus*, but the remaining six are in the range of overlap; thus, this sample is 33.3% assignable to *borealis*. Of the 21 sexed specimens from New Mexico, fully 14 fall in the range of overlap; of the remainder, 5 are in the exclusive class of large *invictus* and two in that of small *borealis*. The latter two are both adult males (one each from San Juan and Bernalillo counties) that otherwise agree in their pallor with *invictus*, and this is the name that I would apply to them. From this discussion, I conclude that wing length is not a conclusive means of distinguishing *invictus* and *borealis*.

I am unable to duplicate Miller's (1931) measurements for tail length, inasmuch as I obtain consistently smaller values for any age, sex or subspecies group than he did. For example, Miller's mean for adult male (n=11) *invictus* is 117.6 mm, versus mine of 110.7 (n=6) for that race from Idaho; also, his value for adult female *borealis* is 111.3 (n=6), while mine is 106.4 (n=4). Under the circumstances, I do not believe that our data are comparable and thus should not be compared. In addition, our measurements of the amount of white in the tails of specimens cannot be compared directly, as Miller's values are computed as a ratio with tail length. Thus, because of this disparity in data and because my samples of

probable *invictus* and *borealis* specimens are small, I cannot carry through on any comparisons of tail length and "tail white" in assigning the New Mexico material to race. However, I suspect that were the data available assignment on these characters would be as unsatisfactory as that based on wing length.

To summarize, specimens of Northern Shrike from New Mexico agree closely with presumed *invictus* from Idaho in the pallor of the upperparts of all age classes, as well as in the buffy dorsum of immatures. Therefore, I assign New Mexico birds to this race, which breeds from Alaska eastward to Manitoba and winters in western North America.

SUMMARY

The Northern Shrike was first recorded in New Mexico in the winter of 1846-47 and has been recorded in 30 different winters beginning at that time. Until recently, the species appears to have been mainly an occasional winter visitant to the state, but since 1966-67 it has become essentially regular there. The period of occurrence is from 14 October through 22 March, with most records from December – associated with Christmas Bird Counts. Except for the winters of 1976-77 and 1977-78, when the species was locally numerous, it has been a low density visitor to New Mexico, as indicated by the total of 129 individuals recorded in 131 winters. Most records for the state are in the northern half, with only four from the southernmost quarter. Adults equal or slightly outnumber immatures, except that in 1977-78 they comprised about two-thirds of the birds observed. Females outnumber males by that same ratio. The race occurring in New Mexico is *Lanius excubitor invictus*, distinguished by being paler than *L. e. borealis*; mensural characters supposedly separating these races overlap and may not be definitive.

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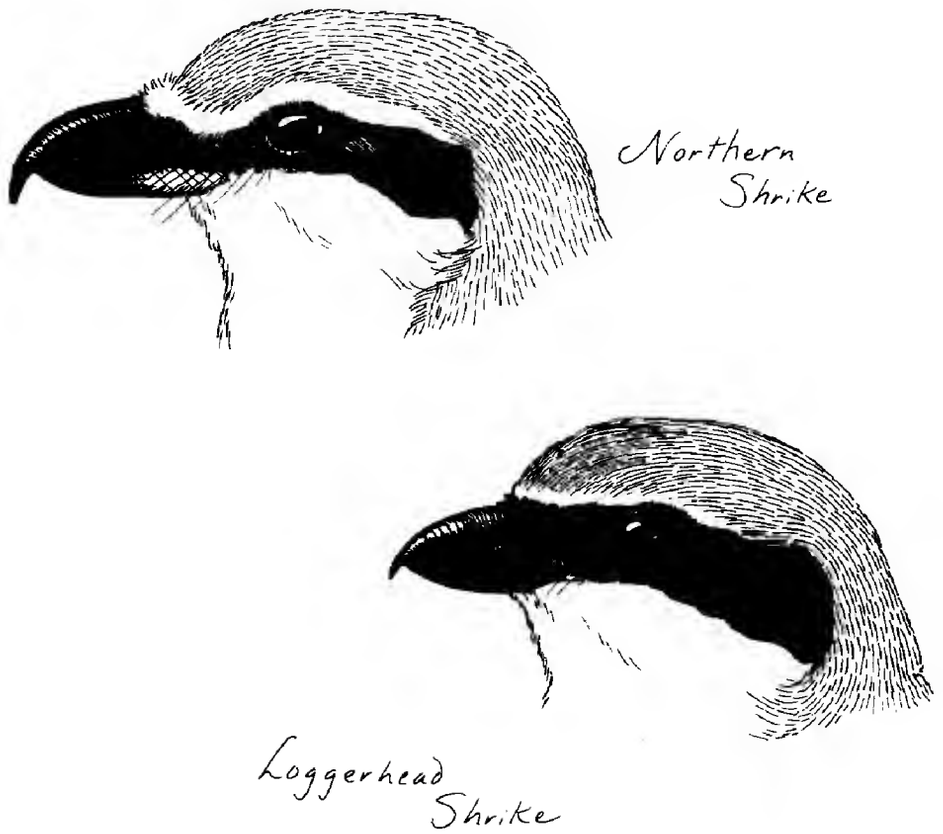

Sketch by Narca Moore

NOTES

PROBABLE BLACK RAIL NESTING RECORD FOR ALAMEDA COUNTY, CALIFORNIA

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Despite numerous occurrences of the Black Rail *(Laterallus jamaicensis)* in central coastal California, there is still no documented nesting record for the species in the State north of Ventura County (Wilbur 1974). Because nearly all historical records of Black Rails in central California have been in fall or winter months, certain authorities (Bent 1926, AOU 1957) have stated or implied that the species winters north of its breeding range.

The large egg collection of the late Henry A. Snow, formerly housed at the Snow Museum in Oakland, was transferred to the Western Foundation of Vertebrate Zoology by the Oakland Museum in 1976. While recently curating this collection, I found a set of eggs taken by Snow on 10 April 1911 at Newark, Alameda Co., California. Snow identified the eggs as belonging to the "Little Yellow Rail." The data slip accompanying the set also bears the AOU number, 215, of the Yellow Rail *(Coturnicops noveboracensis)*.

Snow noted on the data slip that the species identity was "Certain," but this was a routine designation by many collectors of the period, regardless of the method of identification (Storer 1930). On the basis of their appearance and on grounds of geographical probability, I have concluded that Snow's "Yellow Rail" eggs are actually those of a Black Rail.

Figure 1. Eggs taken by Snow at Newark, Alameda Co., California on 10 April 1911 (middle row) compared with eggs of the Black Rail (above) and the Yellow Rail (below). Scale is in centimeters.

Photo by Sam Sumida

There were originally eight eggs in the set, but incubation was so advanced that the collector was able to prepare only four of them. The remaining eggs are white with tiny spots of reddish brown and medium brown liberally sprinkled over their entire surfaces, but slightly concentrated at the larger ends. They are ovate and slightly glossy. One egg is cracked, and two are heavily nest stained. The eggs measure 25.53 x 19.10, 24.39 x 18.88, 24.58 x 18.53, and 24.36 x 18.60 mm. The set is No. 99670 in the Western Foundation of Vertebrate Zoology collection.

In size, color, shape and texture these eggs agree with the description Bent (1926) gave of California Black Rail *(Laterallus jamaicensis coturniculus)* eggs, and they cannot be distinguished from the eggs in 26 sets of that race in the WFVZ collection.

In contrast, the eggs of the Yellow Rail are a distinctive "rich, warm buff," and their superficial markings are generally confined to a wreath of fine spots of "pale sepia or bright cinnamon" around the large end of the egg (Peabody *in* Bent 1926). All of the eggs in the Snow set are smaller than the extreme measurements Bent gave for 32 Yellow Rail eggs.

The nest containing the eggs was stated to have been "placed in the dry matted salt grass about ¼ of a mile up from the marsh; in fact it was almost pasture land. Nest under one of those salt bushes on side of little trail. . ." These details are similar to those described by Ingersoll (1909) and Huey (1916) for Black Rail nests in San Diego County. The Yellow Rail breeds only in fresh water marshes (Ripley 1977), and in California it is known to have nested only in Mono Co., east of the Sierra Nevada, occurring in coastal salt marshes only in winter (Small 1974).

Wheelock (1920) stated that the "Black Rail nests in the marshes at Alviso" (Santa Clara Co., California), but did not provide further details. This statement was evidently discounted or overlooked by Grinnell and Miller (1944), since they did not mention it. The occurrence of juvenile Black Rails at Manzanita, Marin Co., on 11 August 1929 (Kibbe 1929) and at Golden Gate Park, San Francisco Co., on 9 August 1945 (Orr 1947), and the recent confirmation of the presence of the species in several central California marshes during March-May 1977 (Manolis 1978), strongly suggest that it may be a long overlooked breeding resident of central California.

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FIRST RECORD OF A LESSER BLACK-BACKED GULL IN COLORADO

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On 11 December 1976 we found an adult Lesser Black-backed Gull *(Larus fuscus)* standing on the ice at Lake Sangraco, a small sand and gravel borrow area 2.5 km north of Interstate 70 along Lowell Boulevard, northwest of Denver, in Adams Co., Colorado. When first observed it was in a flock of gulls consisting of 15 adult Herring *(L. argentatus),* 5 adult California *(L. californicus)* and 50 adult Ring-billed *(L. delawarensis)* gulls. Later in the week, a first-winter Glaucous Gull *(L. hyperboreus)* and an adult Thayer's Gull *.(L. thayeri)* were also present for comparison. The Lesser Black-backed Gull remained at Lake Sangraco through 1 January 1977. This, the first recorded occurrence of the species in Colorado, was also the first record from the deep interior of the United States.

Description: Body color: entire ventral plumage immaculate white. Body bulk: slightly smaller than adult *argentatus.* Mantle color: deep slate-gray, distinctly paler than primaries. Mantle much darker than that of *californicus*. Wing length: at rest the wing-tip extended slightly beyond the tip of tail. Tail color: pure white. Wing color: primary tips dorsally as black as those of adjacent *delawarensis* and *argentatus.* With the wing folded, the primaries were white-tipped, indicating relatively recent renewal. Two flight photographs verify our observations that white subterminal mirrors were absent from distal primaries. Either these mirrors were lacking or the outermost primaries might have been in molt. When seen from below in flight, the dorsal darkness of the primaries and secondaries was visible through the extended wing, as noticeably as on one of the darker races of the Western Gull *(L. occidentalis wymani).* Secondary color same as mantle, the color shade transition from black primary tips to the slate gray of the secondaries gradual. Head shape: forecrown angularity and supraocular ridge similar to *argentatus.* Crown streaking: strongest on pileum with some streaking above and below eye at base of lower mandible. No streaking on forecrown or chest, or from eye to bill. Iris color: pale straw-yellow, appearing whiter than that of *delawarensis.* Eyelid color: very conspicuous red, providing sharp contrast with iris color and face. Tarsus color: legs, carefully compared with *delawarensis* and *argentatus,* were pale yellow, with no hint of pinkish along tarsi; intensity of leg color was slightly more yellow than adjacent *delawarensis,* whose tarsi at this time had a tinge of pinkish color, especially at the "knee." Tarsus size: only slightly thicker in diameter than *delawarensis* and noticeably less stout than *argentatus.* Left foot damaged, causing the bird to walk with the toes in a closed position. Bill color: bright yellow with very extensive oval red spot at the gonydeal angle. Bill shape: relatively long and shallow; gonydeal angle not as acute as *californicus* or *argentatus,* but more angular than *delawarensis.* Comparisons indicated bill about as long as the longest *argentatus* bill nearby.

All other adult dark-mantled North American gull species could be ruled out on the basis of numerous characteristics, but most readily by: (1) Leg color pinkish to pinkish-white in Great Black-backed *(L. marinus)* and Slaty-backed *(L. schistisagus)* gulls, as well as the two Western Gull races *(L. o. wymani* and *L. o. occidentalis).* (2) Eyelid color yellow in the Yellow-legged Western Gull *(L. occidentalis livens).*

The likelihood of the similar Dominican or Kelp Gull *(L. dominicanus),* a coastal South American gull, or one of the dark-backed yellow-legged Middle Eastern races of the Herring Gull finding its way to the deep interior United States seems extremely remote. Also, *dominicanus* should be in worn plumage in December.

Two observers experienced with *L. fuscus,* P. Gent and W. Brockner, concurred with our identification, as did most other observers who studied the bird. Judging from the overwhelming number of typical *L. fuscus* features, particularly tarsus color and thickness, eyering and iris color, bill shape, body shape, size and mantle coloration, the possibilities that it was a dark-backed *argentatus* or was of hybrid origin ("an intergrade") seem remote. The statement that it "lacked several diagnostic features" (Kingery 1977) thus seems unfounded. Based on examination of study skins, photographs and descriptions of *L. fuscus* in the literature (Dwight 1925, Witherby et al. 1941, Dement'ev et al. 1951, Voous 1963), consideration of probable hybrid characteristics of dark-backed gulls (Jehl 1960, Andrle 1972), and discussions with individuals familiar with the species, we feel that the Colorado Lesser Black-backed Gull best fits the British race *Larus fuscus graellsii.*

The seasonal pattern of many North American winter and spring Lesser Black-backed Gull records corresponds well with the migration pattern of the Old World populations. In the Old World, Wallace (1973) observed coastal wintering of *L. f. fuscus* and *L. f. graellsii,* mainly adults, at Lagos, Nigeria (7°N,5°E), far south of the breeding range. He found a general increase in numbers from November through February, with *L. f. graellsii* peaking in January and dropping off sharply (presumably as birds returned north) in February and March. Details of the species' inland passage through southern Europe are summarized by Voous (1963), where in his discussion of the long distance transcontinental route of *L. f. fuscus* he mentions its occurrence on central African lakes.

Figure 1. Adult Lesser Black-backed Gull *(Larus fuscus,* probably *L. f. graellsii).* 11 December 1976 through 1 January 1977, Lake Sangraco, Adams Co., Colorado.
Photo by Mike Pogue, courtesy Denver Museum of Natural History.

Table 1. Summary of 67 Lesser Black-backed Gull records in North America north and south of 39° latitude, 1968 through 1977.

	November-December	January-February	March-April
North	29 (82.9%)	3 (8.6%)	3 (8.6%)
South	9 (28.1%)	14 (43.8%)	9 (28.1%)

Based on a survey of 10 years of eastern United States *L. fuscus* records in *Audubon Field Notes* and *American Birds* (1968-1977), there is an indication of movement south during January through February (Table 1). The test for equality of percentages (Sokal and Rohlf 1969:608) indicates significant north-south differences ($p<0.05$) between each of the three 2-month periods of November through December, January through February, and March through April. In the northern region (north of 39° latitude), 83 percent of the 35 records occurred during November and December, but in the southern region the highest numbers were recorded during January and February, when 43 percent of the 32 records occurred. In northern localities, 35 percent of all records involved birds remaining longer than two weeks (i.e. probably overwintering individuals); whereas, in southern localities only 13 percent of the records involved birds remaining longer than two weeks. The short duration of most records at southern United States coastal localities suggests that *L. fuscus* is transient there. This leads us to the speculation that some individuals of the North American *L. fuscus* population may migrate through the United States, perhaps to winter farther south along the coasts of Mexico, Central and South America, and in the Caribbean Islands. Based on the correspondence between distributional patterns of the United States and the Old World, we feel that occasional Lesser Black-backed Gulls can be expected in the interior United States in passage from their northeastern summer localities to distant coastal wintering localities.

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POLYGYNY IN UTAH DIPPERS

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Prior to Price and Bock's (1973) findings of polygyny in Colorado, the Dipper *(Cinclus mexicanus)* had been considered to be monogamous. This paper reports polygyny in a second geographical area.

We have been studying reproduction, movements and mortality of Dippers from 1976 to the present. These observations are being made on 8 km of the Ogden River from the mouth of Ogden Canyon to Pineview Reservoir and on 9 km of the South Fork of the Ogden River below Causey Reservoir, both in Weber County, Utah. Adult and nestling Dippers were banded with U.S. Fish and Wildlife Service bands and combinations of colored plastic leg bands to allow individual recognition.

We found a single polygynous male (3.4% of the breeding males) compared to 29 monogamous males in the combined 1976 and 1977 breeding seasons. The incidence of polygyny in Colorado was higher at 12.8% of the breeding males. We observed the male copulating with one of the females, feeding broods at both nests on numerous occasions, and defending the area containing both nests. Both females successfully fledged two broods each; a total of 19 young was "fathered" by the single male. This number compares to an average of 8.75 ± 4.27 young fledged by four polygynous males in Colorado. Egg laying for the first clutches of both females began about 25 April 1977, and the young of the second clutches fledged from 4 to 8 July 1977. Price and Bock (1973) found that territories of the polygynous Dippers they studied were not bordered closely by other territories. In contrast, the territory of our polygynous male was bordered on both sides by other Dipper territories. Price and Bock (1973) observed that nests of the mates of polygynous males were from 180 to 3220 m apart. Nests of the two females in our study were only 100 m apart; one was built under a bridge and the other under a house overhanging the river. The same male and one of the females fledged two broods (total of 9 young) in the same territory in 1976.

Potential Dipper nest sites on the Ogden River were abundant and fairly evenly spaced; several Dipper territories contained two or more. We have no reason to believe that the quality of the territory where polygyny occurred was higher than that of other areas, nor was the territory larger than others.

Our observation supports Price and Bock's (1973) prediction that polygyny in Dippers occurs in other populations.

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FIRST RECORD OF THE BLUE-FACED BOOBY FROM THE PACIFIC COAST OF THE UNITED STATES

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On 10 January 1977, while conducting marine bird and mammal surveys in the Southern California Bight, we observed a Blue-faced Booby *(Sula dactylatra)*. To our knowledge this represents the first record of this species from the Pacific coast of the United States. All other Blue-faced Booby records over coastal waters of the U.S. are from the southern Atlantic coast and along the coast of the Gulf of Mexico (Palmer 1975).

Late in the afternoon of 10 January our vessel, the *Kona Princess,* was proceeding northeast from Bishop Rock (Cortés Bank) as part of bimonthly transect surveys of the Southern California Bight (Briggs et al. 1976). At 1645 our position was approximately 32°37.5'N, 118°44'W, some 35 km southwest of the south end of San Clemente Island. Four observers (D.B.L., W.B.T., David H. Dettman and Mark O. Pierson) were recording bird and mammal sighting data from the flying bridge 6 m above sea level. The booby was first sighted about 75 m away, approaching from the northeast, flying low over the water. It drew to within 20 m, circled the boat once at close range, then followed briefly over the wake. It then proceeded along the starboard side to within 3 m of the observers and finally departed back to the northeast. During its 3 minute visit the booby was seen clearly by the four observers, all of whom were equipped with 7x35 mm binoculars.

We compiled the following description of the bird from all four observers: a very large robust white and black bird; face (mask), scapular tips and flight feathers (primaries, secondaries, rectrices) black or very dark; head, neck, body and most wing and tail coverts white. Total length was estimated at 85-90 cm. The greenish yellow bill was long and pointed, with a stout base. The legs were dull greenish blue. We did not note eye color, and no photographs were taken.

The very similar light morph Red-footed Booby (*Sula sula*; dark-tailed form) has red feet, a bluish bill with pink-flesh base, and no mask. Huber and Lewis (MS) recently documented the separate occurrences of two Red-footed Boobies on South Farallon Island during summer and autumn 1975, one of which was a light morph, dark-tailed bird. The Blue-footed Booby *(S. nebouxii)*, occasionally seen in southern California, has a dark mantle and bill, and bright chalk blue feet. The Brown Booby *(S. leucogaster)*, also rarely reported from southern California, has all dark upperparts including the entire head and neck. Gannets (*Morus* spp.), with white secondaries and yellowish heads, are birds of the Atlantic Ocean and the southern hemisphere.

The Blue-faced Booby is a cosmopolitan resident of tropical marine waters. As is typical of tropical members of the Sulidae, it is nonmigratory. Although adult birds prefer to forage well offshore, they do not actually disperse after the breeding season (Palmer 1975). Five subspecies of *Sula dactylatra* are currently delineated as follows: *dactylatra* from the western Atlantic, *californica* from the Pacific coast of Mexico and Central America, *granti* from the Pacific coast of South America, including the Galapagos archipelago (although the latter two forms are probably not validly separable; J. B. Nelson pers. comm.), *melanops* from the Indian Ocean and *personata* from the central Pacific, including the Hawaiian Islands (Palmer 1975, Nelson 1978; but see also Rothschild 1915, Matthews 1921, Murphy 1936). Morphological differences between these races include soft parts coloration (bill, legs, mask, iris), size and shape of bill, and overall body size. However, since variations occurring with age, sex and season are poorly documented, race determination by soft part coloration is potentially unreliable.

The task of determining the origin of this Blue-faced Booby is therefore a difficult one. Of the five subspecies only *californica* exhibits a geographic range proximal to southern California. Birds of this race breed on Alijos Rocks, situated 265 km off the west coast of Baja California and just 875 km south of the U.S.-Mexico border (R. L. Pitman pers. comm.). This sighting might be attributed to the *personata* race of the mid-Pacific (and Hawaiian Islands). Though the nearest nesting sites are 4000 km away, that is not considered an extreme range for a sulid. Also, considerable shipping traffic transits between the Hawaiian Islands and southern California, and sulids are well-documented shipboard hitch-hikers (Huber and Lewis MS). Furthermore, the physical characteristics described for *personata* agree well with those of our sighting. Atlantic coast records are of the nominate race, but this and the remaining races can be discounted on the basis of distant geography and/or characteristic physical differences as noted. Therefore, we believe our Blue-faced Booby to be probably the Mexican *S. d. californica* or possibly the Hawaiian *S. d. personata*.

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The following people aided materially in compiling this note. Mark Pierson and Dave Dettman participated in the original observation. Roy Raynor and his crew on the R. V. *Kona Princess* carried us on this and many other successful transect voyages. Bob Pitman shared some of his well-rounded knowledge of boobies with us. Ken Briggs added editorial assistance and incentive. The sighting was made during a regularly scheduled standard transect of the Southern California Bight under the United States Department of Interior, Bureau of Land Management Contract #AA550 CT6-26, K. S. Norris, G. L. Hunt, Jr., and B. J. LeBoeuf, principal investigators.

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YELLOW-CROWNED NIGHT HERON IN CALIFORNIA

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According to the work of Dawson (1923) and Grinnell and Miller (1944), there were no records of the Yellow-crowned Night Heron *(Nyctanassa violacea)* occurring in California. Grinnell and Miller did state, however, that there was "ground to expect stragglers from the south across the Mexican line into San Diego County." Since the time of these works there have been five or six California records (McCaskie 1964, Small 1974), none of which are from Orange County. All sightings have been from coastal California, except the Claremont-Harbor Park bird(s) of 1963 (see Appendix).

Because of the paucity of sightings of this species, I was astonished to see a Yellow-crowned Night Heron while driving with Ken Hoffman through the San Joaquin Marsh, Irvine, Orange County, on the morning of 11 May 1977. The bird was an adult in full breeding plumage (Figure 1), and was standing on a bare branch about 7 m above ground in a tree next to the road. The bird was first observed at 0745, but was

Figure 1. Adult Yellow-crowned Night Heron *(Nyctanassa violacea),* San Joaquin Marsh, Irvine, Orange County, California, 11 May 1977.

Photo by Don Hoechlin

shortly lost from view for approximately 1 hour. The bird then reappeared on a snag where it remained for approximately 4 hours, being closely observed and photographed. The bird then moved deeper into the marsh and continued to do so for the remainder of the afternoon, being last seen at 1630.

The Yellow-crowned Night Heron occurs throughout much of the eastern United States, around the Gulf of Mexico and in parts of South America with a separate population, *N. v. bancrofti,* in western Mexico (Palmer 1962). A bird collected at Imperial Beach in 1963 (McCaskie 1964) was identified as *N. v. bancrofti,* and it is suspected that the other birds found in California were of this same race.

Although rare in California, the Yellow-crowned Night Heron may occur somewhat more often than the records indicate because immature birds (only adults and subadults have so far been identified) can be easily overlooked and dismissed as immature Black-crowned Night Herons. But field identification can be made if the longer-legged appearance and the shorter wider bill are appreciated. The greyer coloration and lesser amount of spotting on the back and wings are less easily discerned. In flight, one of the best field marks is the extension of the entire foot and a portion of the tarsus beyond the end of the tail. Only a portion of the foot extends beyond the tail in the Black-crowned Night Heron, if the tail feathers are fully grown.

I would like to thank Alan Craig and Guy McCaskie for their helpful criticism of the rough draft of this article.

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APPENDIX

Records of Yellow-crowned Night Heron in California are listed in chronological order. AFN refers to *Audubon Field Notes* and AB to *American Birds.*

1. Venice, Los Angeles Co., last week June 1951. AFN 5:308, 1951.
2. Imperial Beach, San Diego Co., 3 Nov 1962, one adult. AFN 17:67, 1963.
3. Claremont, Los Angeles Co., 27 Mar-3 Apr 1963. AFN 17:357, 434, 1963.
4. Harbor Park, Los Angeles Co., 30 May-2 June 1963, may have been the same bird reported from Claremont. AFN 17:434, 1963.
5. Imperial Beach, San Diego Co., 22-25 Oct 1963, adult male (specimen). AFN 18:73, 1964.
6. San Rafael, Marin Co., 12 July 1968-25 Aug 1968; 3 May 1969-3 Sept 1969; 10 May 1970-27 July 1970; 29 May 1971; 28 May 1972; 5 Nov 1972; 29 June 1973-Oct 1973, one adult. AFN 22:643, 1968; AFN 23:100, 1969; AFN 23:620, 1969; AFN 23:690, 1969; AFN 24:89, 1970; AFN 24:639, 1970; AFN 24:712, 1970; AB 25:794, 1971; AB 26:803, 1972; AB 27:113, 1973; AB 27:913, 1973; AB 28:100, 1974. One was present at this locality for six consecutive summers (AB 27:913, 1973), presumably the same individual. A subadult was reported in 1968 and 1969, and an adult thereafter.
7. Irvine, Orange Co., 11 May 1977, adult. AB 31:1047, 1977.
8. Tomales Bay, Marin Co., 5 July 1977. AB 31:1183, 1977.

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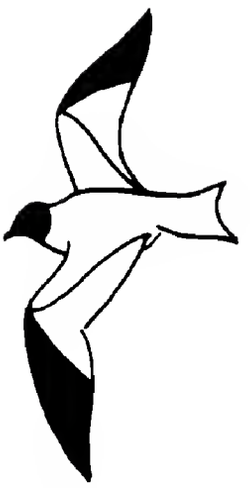

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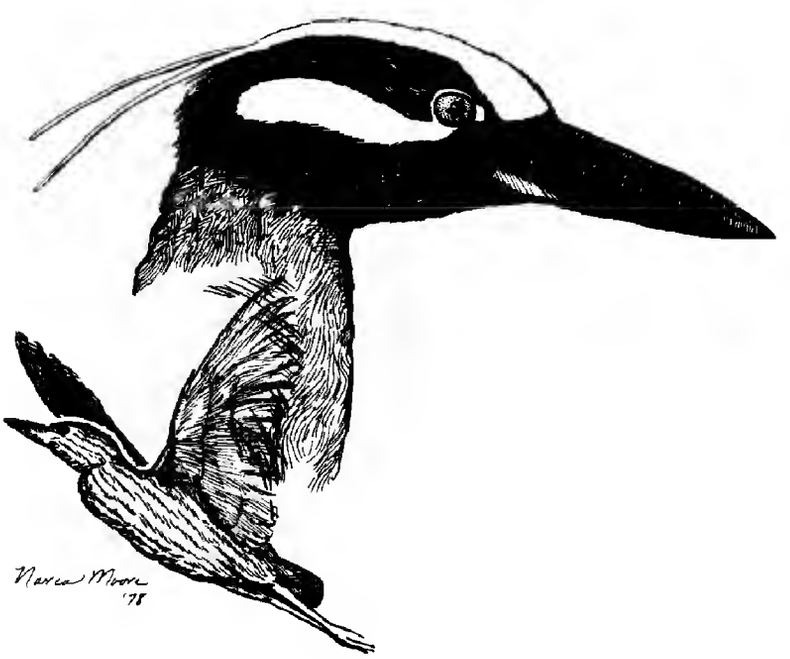

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